# EXECUTIVE SUMMARY
# DRAFT TRITIUM SAMPLING AND ANALYSIS PLAN

In 1991, the United States Environmental Protection Agency (EPA) initially evaluated Ernest Orlando Lawrence Berkeley National Laboratory (Berkeley Lab) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for possible inclusion on the federal Superfund list. The EPA determined at that time that Berkeley Lab did not qualify as a Superfund site. In 1997, the Committee to Minimize Toxic Waste (CMTW) (a Berkeley-based organization) formally requested that EPA review additional data regarding tritium contamination and re-evaluate Berkeley Lab for possible listing as a Superfund site. In evaluating Berkeley Lab, the EPA considered data submitted by CMTW and the United States Department of Energy (DOE). EPA issued a preliminary Superfund Evaluation Report in July 1998, with a finding that Berkeley Lab is potentially eligible for the National Priorities List because of the tritium levels in ambient air that were reported by the Berkeley Lab. EPA has recognized, however, that although the tritium levels in air sometimes exceeded Superfund screening criteria, they have been well below its National Emissions Standards for Hazardous Air Pollutants (NESHAPs). These are the EPA standards used to protect public health, and are set under the federal Clean Air Act.

In the July 1998 report, EPA stated that while the operation of the National Tritium Labeling Facility (NTLF) resulted in detectable but small levels of tritium in nearby soil, groundwater, and surface water, the data do not show tritium concentrations in sufficient quantities to necessitate action for remediation. Nevertheless, EPA has requested additional sampling to support a final decision.

The present draft of the Tritium Sampling and Analysis Plan has been developed in direct response to EPA's July 1998 decision. In September 1998, EPA requested that additional samples of soil, surface water, sediment, and ambient air be taken in a way that is consistent with EPA Superfund guidance and that considers input from local stakeholders. These samples would be used by EPA to determine the nature and extent of present tritium contamination in the environment surrounding Berkeley Lab, and would enable EPA to make a final decision as to whether or not Berkeley Lab is eligible to be listed on the National Priorities List.

Under the scope of the Tritium Sampling and Analysis Plan, EPA will be the primary data user to support the scoring of Berkeley Lab, using EPA's Hazard Ranking System.

In this Tritium Sampling and Analysis Plan, a series of planning steps, known as the data quality objective process, is designed following EPA Superfund guidance to ensure that the type, quantity, and quality of environmental data used in the decision making process are appropriate for the intended application. This Superfund process clarifies the study objective, defines the most appropriate type of data to collect, determines the most appropriate conditions from which to collect the data, and specifies acceptable levels of decision errors that will be used as the basis for establishing quantity and quality of data needed to support the decision. The data quality objective process consists of seven sequential steps, which are presented in Section 2.4 of the sampling plan. Section 2.5 discusses special training requirements for field personnel who collect

samples and operate sampling equipment. Documentation and record keeping required by this project are explained in Section 2.6, including field operation records, analytical laboratory records, a Technical Systems Audit report, and reports of results. In Section 3 of this plan, the discussion focuses on the requirements for sampling process design, sampling method, sample handling and custody, analytical methods, quality control, inspection calibration and frequency, inspection and acceptance criteria for supplies and consumables, data acquisition, and data management. Section 4 includes a discussion of onsite audit and performance evaluation programs. Finally, Section 5 presents information on the steps to verify that requirements have been met regarding the data collection process and steps to review and validate the data.

To ensure that sufficient information is generated, Berkeley Lab proposes to take samples in a variety of environmental media. Because the primary exposure pathway is air, the sampling plan presents a methodology for acquiring additional ambient air samples. To assure that potential secondary exposure pathways are considered, EPA recommends that samples be taken in soil, sediments, and surface water. To address public concern over tritium levels in vegetation, Berkeley Lab will collect samples of vegetation and plant-transpired water.

Attachment 1 discusses the field sampling plans for tritium in soil, sediment, surface water, ambient air and vegetation.

Attachment 2 contains the September 3, 1998, letter from EPA requesting that DOE provide additional environmental samples to allow EPA to complete the evaluation of the site.

Attachments 3 and 4 contain the standard operating procedures used for sample collection activities.

Attachment 5, 6 and 7 contain the standard operating procedures for the analysis of tritium in various media. The various procedures used by the Lab's commercial lab, Thermo NUtech Laboratory, and by the onsite lab, Radiation and Analytical Measurements Laboratory (RAML), are given. Thermo NUtech has been designated as the primary lab to be used in conjunction with the Tritium Sampling and Analysis Plan.

Attachments 8 and 9 provide performance evaluation test results under DOE and EPA programs and audit results from a joint Berkeley/Livermore Lab team.

Attachment 10 provides an example of the data package currently provided by Thermo NUtech for Berkeley Lab.

A summary is also provided for each attachment, which is located in front of each attachment section.

In order to enhance stakeholder involvement in the development and implementation of the Tritium Sampling and Analysis Plan, Berkeley Lab has established the Environmental Sampling Project Task Force consisting of 21 community stakeholder groups. The members of this Task Force are being requested to review the sampling plan in detail, making comments to DOE and EPA for their consideration in revising or augmenting this sampling program. They will also review and comment on the actual sampling and its results.

Berkeley Lab is a multipurpose research facility managed and operated by the University of California as part of the United States Department of Energy's national laboratory system. Berkeley Lab performs nationally recognized research in the

biological, physical, materials, chemical, energy, and computing sciences. The Laboratory operates unique user facilities available to qualified investigators, including the National Tritium Labeling Facility.

During the normal course of research and development activities the NTLF uses tritium, a radioactive form of hydrogen. While the majority of the tritium used at the NTLF is recycled or captured, a small percentage is released to the environment through an exhaust stack.

The NTLF was formally established as a National User Facility in 1982 and the scientific function is funded by the National Institutes of Health (NIH), through the Biomedical Technology Area (BTA) of the National Center for Research Resources. The work performed at the NTLF is highly collaborative in nature. This collaboration is carried out with investigators at numerous universities, medical schools, hospitals, and research institutes. This collaboration is enhanced by the unique location of the NTLF at Berkeley Lab, which is in close proximity to universities and medical institutions of the San Francisco Bay Area and can be readily accessed from the San Francisco and Oakland International Airports. The NTLF offers the U.S. and international biomedical research community a fully equipped laboratory for the synthesis and analysis of tritium labeled compounds. Research at the NTLF includes the development of new methods for tritium labeling of molecules of biological interest and the use of tritium spectroscopy to study dynamic chemical and biological processes.